Fatih Calakli

EDUCATION- **B.Sc** Electrical & Electronics Engineering (w/ honors), Bogazici University, Istanbul, TURKEY May 2007
M.Sc, Computer Science (GPA: 3.75) Brown University, Providence, RI May 2012
M.Sc, Applied Mathematics (GPA: 4.00) Brown University, Providence, RI May 2012
PhD Candidate, Electrical Sciences & Engineering (GPA: 3.90) Brown University, Providence, RI 2007-14

Fatih Calakli is an expert in Computer Vision Research Science and Software Engineering focused on applying techniques from geometry, machine learning, optimization, and signal processing to challenging real-world problems. His main research activities falls within computer vision and computer graphics and includes image restoration, stereo image rectification, scene insertion, geometric/color calibration of projector-camera systems (including hardware synchronization of such systems), feature matching and tracking, camera pose estimation, 3D point cloud acquisition using active/passive stereo systems, point cloud alignment, surface reconstruction from a variety of range data, color-map synthesis for polygon meshes, mesh processing/smoothing. His is experienced in computer vision tasks including object detection/recognition, segmentation, video tracking, and motion estimation. His Dissertation work involved surface reconstruction (aka polygon mesh generation) from various 3D data sources such as unstructured point clouds, medical cross-sectional curves, and probabilistic volumes (e.g. occupancy grids), Color-map synthesis for polygon mesh surfaces (directly handled in the surface reconstruction framework by elegantly diffusing the color signal from 3D range data to the generated surface) and single-shot 3D shape acquisition system using structured light (projector+camera)..

AWARDS & HONORS - Recipient of the Brown University PhD Student Fellowship. 2007-2008; Dean's Honor List - Bogazici University, School of Engineering. 2007; Tuition Waiver for 1 year academic exchange at the University of Washington, Seattle, WA 2005-2006; Recipient of the Bogazici University Scholarship for Undergraduate studies. 2003-2007; Ranked 50th out of 1.5 million candidates in nation-wide university entrance examination in Turkey. 2002

Programming Skills - C/C++, Matlab, Java, Python, LATEX.

EMPLOYMENT
Software, Electrical and Computer Engineer, January 2014 to present, ***M***ATERIALS ***S***CIENCE ***A***SSOCIATES, LLC, North Kingstown, RI. 3D image analysis and forensic consulting services for government, hospital, legal, insurance, medical, and manufacturing needs. Software engineering, algorithm development, video analysis, 3D image reconstruction, enhanced and super resolution for photographic and video images.

Graduate Research Assistant, School of Engineering, Brown University June 2009 - September 2013
Conducted research in the field of Computer Vision/Graphic. His Dissertation work involved Surface reconstruction (aka polygon mesh generation) from various 3D data sources such as unstructured point clouds, medical cross-sectional curves, and probabilistic volumes (e.g. occupancy grids), Color-map synthesis for polygon mesh surfaces (directly handled in the surface reconstruction framework by elegantly diffusing the color signal from 3D range data to the generated surface), Single-shot 3D shape acquisition system using structured light (projector+camera).Published 1 journal paper, 1 book chapter, 2 conference papers, and 2 workshop conference papers.

Research Intern, Ricoh Innovations, Inc. June 2012 - September 2012
Implemented a 3D data capture platform using structured light (projector+camera) using state-of-the-art techniques and algorithms. Filed 1 US patent application: on pre-calculation of phase-shift patterns by taking into account projector lens distortion

Teaching Assistant, ENGN 2502 3D Photography, School of Engineering, Brown University, Spring 2012
Teaching Assistant, ENGN 1610 Image Understanding, Brown University, Fall 2009
Teaching Assistant, MATH 0090 Introductory Calculus I, Brown University, Fall 2008 & Spring 2009

RESEARCH PUBLICATIONS

Calakli, F., Ulusoy, A. O., Restrepo, M. I., Taubin, G., & Mundy, J. L. (2012, October). High Resolution Surface Reconstruction from Multi-view Aerial Imagery. In 3D Imaging, Modeling, Processing, Visualization and Transmission (3DIMPVT), 2012 Second International Conference on (pp. 25-32). IEEE.

Calakli, F., & Taubin, G. (2011, September). SSD: Smooth signed distance surface reconstruction. In Computer Graphics Forum (Vol. 30, No. 7, pp. 1993-2002). Blackwell Publishing Ltd.

Andalo, F. A., Calakli, F., Taubin, G., & Goldenstein, S. (2011, November). Accurate 3D footwear impression recovery from photographs. In Imaging for Crime Detection and Prevention 2011 (ICDP 2011), 4th International Conference on (pp. 1-6). IET.

Ulusoy, A. O., Calakli, F., & Taubin, G. (2010, June). Robust one-shot 3D scanning using loopy belief propagation. In Computer Vision and Pattern Recognition Workshops (CVPRW), 2010 IEEE Computer Society Conference on (pp. 15-22). IEEE.

Ulusoy, A. O., Calakli, F., & Taubin, G. (2009, September). One-shot scanning using de bruijn spaced grids. In Computer Vision Workshops (ICCV Workshops), 2009 IEEE 12th International Conference on (pp. 1786-1792). IEEE.

BOOK CHAPTERS

Calakli, F., & Taubin, G. (2012). SSD-C: Smooth signed distance colored surface reconstruction. In Expanding the Frontiers of Visual Analytics and Visualization (pp. 323-338). Springer London.

CONFERENCE PRESENTATIONS

High Resolution Surface Reconstruction from Multi-view Aerial Imagery, Second International Conference on 3D Imaging, Modeling, Processing, Visualization and Transmission, 2012, Zurich, SWITZERLAND.

Smooth Signed Distance Surface Reconstruction, 19th Pacific Conference on Computer Graphics and Applications, 2011, Kaohsiung, TAIWAN.

Accurate 3D Footwear Impression Recovery From Photographs, Fourth International Conference on Imaging for Crime Detection and Prevention, 2011, London, UK.

Robust one-shot 3D scanning using loopy belief propagation, IEEE Computer Society Conference on Computer Vision and Pattern Recognition Workshops, 2010, San Francisco, CA.

One-shot scanning using de bruijn spaced grids, IEEE 12th International Conference on Computer Vision Workshops, 2009, Kyoto, JAPAN.

Graduate Courses

3D Photography (Grade: A); Pattern Recognition and Machine Learning (Grade: A); Video Processing (Grade: A), Digital Geometry Processing (Grade: A), Speech Processing (Grade: A), Image Understanding (Grade: A), Recent Applications of Probability and Statistics (Grade: A), Information Theory (Audit), Operations Research: Probabilistic Models (Grade: A), Statistical Inference I (Grade: A), Design and Analysis of Algorithms (Grade: B), Scientific Programming in C++ (Grade: A), Numerical Solutions of Partial Differential Equations I (Grade: A), Mathematical Methods in Engineering and Physics II (Grade: A), Mathematical Methods in Engineering and Physics I (Grade: A).

PATENT APPLICATIONS

US Provisional Patent Application No. 61/703,541, METHOD TO RECONSTRUCT A SURFACE FROM ORIENTED 3-D POINTS. filed September 20, 2012; Inventor(s): TAUBIN, Gabriel; CALAKLI, Fatih

U.S. Patent Application No. 13/665,880, Title: Pre-Calculation of Sine Waves for Pixel Values, Filing Date: October 31, 2012;Inventors:Fatih Calakli and John Barrus